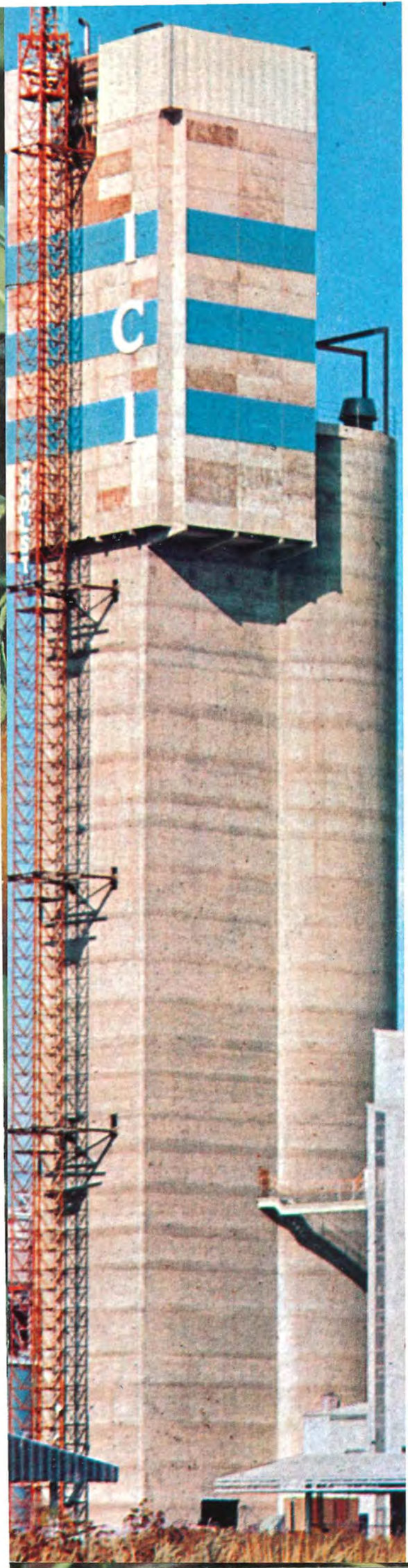


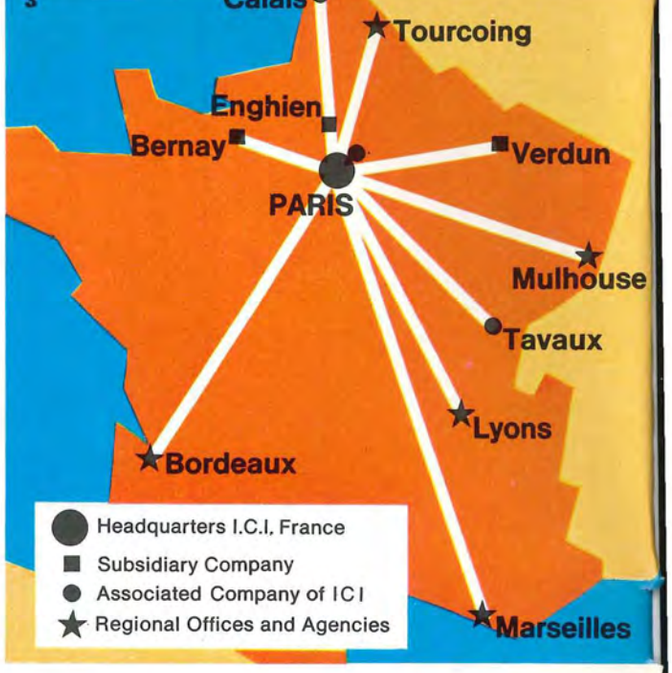
ICI magazine

October 1969





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4

in this issue

1 The commissioning of this new plant at Billingham to make 360,000 tons a year of 'Nitram' fertilizer by spraying hot ammonium nitrate solution from the top of the tower, so that it solidifies and cools into hard round 'prills,' is one of Agricultural Division's answers to the Challenge of Change. See page 224.
2, 3 and 4 Paris is still the administrative centre of ICI activity in France but recently Donald Robertson and his staff with I.C.I. France moved to new offices well away from the city centre. For the first time in years they now work under the same roof: new buildings include an attractive modern cafeteria with a spacious kitchen.
Read about their house-warming on page 220. (In the key to the map, 'Subsidiary company,' applies to subsidiaries of I.C.I. France and of ICI.)
5 Vacation-work experience with Mond Division made the sculptor of this dragon-fly think of ICI 'Perspex' when he was looking for coloured materials on which to mount creamy-white ivory carvings. Page 237.


5

ICI magazine

Volume 47 Number 355

I.C.I. France moves house
Donald Robertson **220**

The challenge of change 4: Agricultural Division **224**

ICI on the farm **228**

All on the surface
Alex Ames **230**

The world of ICI **232**

October in your garden
Percy Thrower **236**

Ivories on 'Perspex'
Carson Ritchie **237**

people in print

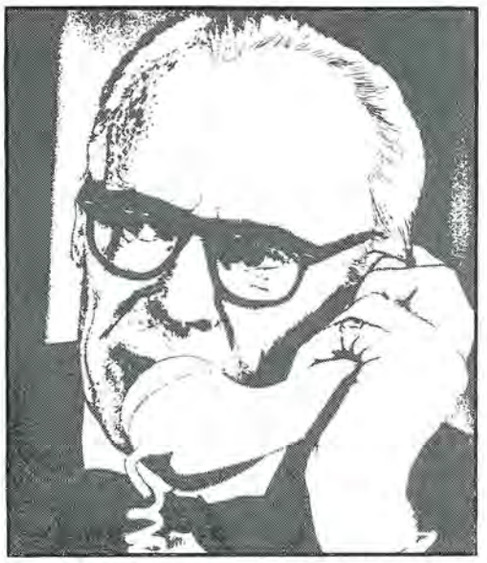


Carson Ritchie, *author of 'Ivories on 'Perspex',' (page 237), is married to the daughter of an ex-employee of Castner Kellner Works, where he and his wife both worked on vacation in their student days. His mother-in-law was also an employee of Castner Kellner Works. An M.A., Ph.D. from St Andrews University, he now works as senior lecturer in history in the division of humanities at Woolwich Polytechnic. Dr Ritchie has written a book 'Ivory Carving', to be published in November, and held an exhibition of his carvings – all mounted on 'Perspex' – in London last month. Other hobbies include collecting teapots and jade – and writing horror stories.*



Alex Ames, *author of 'All on the surface' (page 230), is sales control manager in the Product Group D of Dyestuffs Division. A graduate not only of Leeds University but of a Canadian university 'whose main end-product was Anglican clerics', he joined Dyestuffs Division as a chemist in 1940 and, apart from service with the Canadian Army from 1943 to 1946, has been with the Division ever since.*

For 25 years he has been associated with the surface-coating industry in Britain and overseas, and for the past five years has been deeply involved with marketing the revolutionary new products developed in the Division and now gaining widespread use. He is chairman of the British Colour Makers' Association, whose products can also be used in some of the outlets described in the article in this issue.



Donald Robertson, *who in 'I.C.I. France moves house' (page 220), writes about the background of the company's move into new Paris headquarters, has been President Directeur General (chairman and managing director) of I.C.I. France since 1946. During that time it has become one of ICI's largest selling companies. Educated at Charterhouse and Bonn University, he joined ICI in 1933, and served before the war with ICI Treasurer's Department, with Chance and Hunt, and in the sales control department of the former General Chemicals Division.*

From 1957 to 1962 he was also head of Fermeture Eclair, Lightning Fasteners' company in France. Donald Robertson speaks faultless French and in France is often taken for a Frenchman. The pace of business and social life in Paris – often hard to separate, he finds – has greatly accelerated over the years in an ever more crowded working environment.

To relax, he plays tennis all the year round and swims as often as he can in the summer. He and his wife, who is half-French, are very fond of the Paris theatre and of listening to classical music. They holiday mostly in the south of France, in the Var Department, where they have built a house to which they look forward one day to retiring.

Front cover: I.C.I. France has moved into a new six-storey office block of its own on a new industrial site at Clamart, near Paris. This is the third major move since the war, during which period the turnover has increased two hundred times.

For six months now the address has been 8, Avenue Réaumur, Zone Industrielle, 92, Clamart Principal – the first time for many years that all 130 HQ people of I.C.I. France have been together under one roof.

The site, some 10,000 square metres (2½ acres), is big enough to allow for future expansion, while the building itself can be extended by adding a wing of equal height, to bring total office space up to some 60,000 square feet if need be. There is a bright, modern cafeteria behind the main building, and a tennis court. Many leading British and Continental firms have also moved to Clamart, where a new industrial community is springing up in this green wooded countryside a few miles south of Paris.

To mark the move, I.C.I. France gave a 'housewarming' on October 2, attended by French customers, business associates, and government officials. See our picture story 'I.C.I. France moves house' on page 220.

Photograph: Nicholas Tikhomiroff

Back cover: Cox's Orange Pippin apples are the main fruit in the Plant Protection Ltd orchard at Fernhurst, where 5000 trees are grown on nearly 70 acres. Other parts of the highly profitable 400-acre commercial estate grow strawberries, vegetables and glasshouse tomatoes, cucumbers, and flowers for London markets.

Photograph: Jean Elsey, Plant Protection Ltd

ICI Magazine for employees at home and abroad appears every month, price 2d. Members of the Company are invited to submit articles, photographs and suggestions for articles. Material offered should reflect the author's own experience, interests or ideas. Payment is made for articles or illustrations accepted. The Company does not necessarily endorse the views of contributors.

Published by Imperial Chemical Industries Limited, Internal Information Unit, Imperial Chemical House, Millbank, London SW1

Editor Francis Odle

Designer Raymond E. Meylan

Printers The Kynoch Press, Birmingham

I.C.I. FRANCE MOVES

Donald Robertson

Steady growth at an average rate of over 25 per cent a year has made I.C.I. France one of the larger sales companies and has already forced it to move twice in 20 years. Now it has gathered together under one roof all its 130 Paris staff in a new office block out at Clamart, an industrial estate a few miles south of Paris. Here, in pleasant green surroundings, it hopes to go on expanding – and has the space to do so. SOPRA, ICI's plant protection company in France, has moved to the same offices. On October 2 they held a joint house-warming party for customers, colleagues and French government officials. It was attended by more than 350 guests, some of whom are seen opposite.

In 1946, when I joined I.C.I. France, it was a small sales company with a limited range of products which had just managed to survive the war. Now it is one of ICI's largest selling companies, its turnover having increased 200-fold over the past 23 years. Such growth stems from a combination of causes, most important of which was a freeing of French trade restrictions about ten years ago. At the same time, I.C.I. France could not have gained so much from the opportunities this presented if parent activity had not created the kind of product which could sell successfully on the French market.

In those early days of the later forties, I.C.I. France, like so many of ICI's interests in Europe, faced two major obstacles to expansion. One was the protective measures taken by every nation struggling to revive its economy and business life. The other was the many claims on the resources of ICI in the UK, in seeking to meet home demand long pent-up during the war.

For quite a few years, then, we could not do very much more than get the original business going again. The beginnings of I.C.I. France go back to a small company, S. H. Morden et Cie, which had been an agent of the old British Dyestuffs Corporation, one of the four constituent companies which formed ICI back in 1926. It was bought up by ICI in the early nineteen-thirties, but up to 1939 its only business in France was in products made by Dyestuffs Division, plus a few Plant Protection Ltd specialities.



In those days, ICI's overall range of chemicals was much smaller, and specialities or novelties were fewer. Moreover, as a policy, the Company practically kept out of Europe, leaving it to the Continental manufacturers. But the war changed all this. At the end, German industry was prostrate, and the French economy was barely convalescent. So when we had our business on its feet again, the situation was that ICI at home had developed some potentially world-beating products – but it looked as if we in this French market would have to wait a long time to take full advantage of them.

Apart from the necessary measures referred to above, there is a long tradition of protection in France, while it is also, by British standards, an extremely bureaucratic country in which business must conform to a mass of regulations. In 1959, however, when the Common Market began to be effective, the Gaullist government liberalised virtually all imports, and although we did not benefit straight away, we achieved the staggering increase of 46 per cent in our turnover in the next trading year. This freeing of trade, followed by the expiry of licences for polythene and for 'Perspex' – allowing ICI to sell these products itself in the French market – then benefited us progressively, year after year. Between 1946 and 1959, the turnover of I.C.I. France had risen by about 28 per cent a year, and in the last ten years it has increased by 23 per cent a year.

The Company's principal interests in France (apart from minority holdings in Societé Francaise Duco (paints and varnish-makers) and Solvic (a joint company formed with the Belgian Solvay Company to make pvc)) are I.C.I. France, the selling company; Produits Chimique de Baleycourt, near Verdun, which makes 'Cereclor' chlorinated paraffins and phthalate plasticisers for pvc; Laboratoires Avlon, at Enghien, which processes and sells ICI pharmaceuticals and whose foundation, like that of PCB, owes much to I.C.I. France; and SOPRA (Societé pour la Protection de l'Agriculture), which sells Plant Protection Ltd's products in France, made up and packed at a factory at Bernay, Normandy.

Since the French have a heavy chemicals industry of their own, with which it would be hard to compete in France, I.C.I. France has always concentrated on the more sophisticated highly-technical products, for which the outlets are most promising. Pace-setters, then, of recent years, have been synthetic fibres, which we started marketing early in 1966 and which now account for a quarter of our turnover; titanium dioxide, a white pigment, made now in Calais and sold by us for British Titan Products, a company in which ICI has a 30 per cent interest; the plasticisers and chloroparaffins of Produits Chimiques de Baleycourt; and, of course, 'Alkathene', sales of which increase regularly every year. It is to these, all made in the Common Market, that we owe our expansion, although we still rely greatly on our older products, such as dyestuffs, pigments, rubber chemicals, 'Alloprene', catalysts and pentaerythritol. As we grew, we found ourselves moving at regular intervals from one office to another, all in Paris itself.

One reason why we came out to the new industrial estate in Clamart was my own feeling, shared by ICI (Europa), that the time had now come for a long-term solution. We have recently moved into our own office block of 3600 square metres [38,750 sq. ft.] on a site of 10,000 square metres [$2\frac{1}{2}$ acres] in all. We also have a large canteen building, an all-weather tennis court, parking-space for about 120 cars, and a pleasant garden. We came out here because office space in the business quarters of Paris is very costly. If we had built in the more fashionable districts for the big office blocks, we would not only have had to pay 50 per cent more than we paid here, but would not have had any space for further expansion. Here we have all our HQ people under one roof, about 130 all told, and we could build on a 6-floor wing, giving another 2400 square metres [25,830 sq. ft.] of office space. Later on Laboratoires Avlon will be taking up the ground floor at present let on a short-term basis to neighbours, Massey Ferguson. This site should see I.C.I. France through to the year 2000, but if our expansion should be such that this is not so, well, so much the better!

HOUSE

Photographs: Nicholas Tikhomiroff

'France has changed much in my time here', says Donald Robertson (opposite page), chairman and managing director, 'and will keep on changing. Some of the old France one is bound to regret – above all the France that was mainly a rural nation with the slower pace and wise enjoyment of the good things of life that this country so amply produces. On balance, however, the changes should in the end mean a better life for more people, the more rapid overcoming of poverty and a stronger economy. I am confident that in building up for themselves a stronger commercial position in Europe and the world, the French will not sacrifice those indefinable graces, that quality of life, which is uniquely theirs.'



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1 Mr Christopher Soames, right, H.M. Ambassador to France, with Mr Jack Callard, a deputy chairman of ICI who is also chairman, Western Europe Overseas Policy Group. In his speech, delivered in French, Mr Callard stressed the close links between ICI and the assembled French customers
2 Mr Douglas Bell, chief executive, ICI (Europa), listens intently to Mr Frank Lytton, export sales manager, New Metals Division, IMI
3 M. Delgrange (left), managing director, Jules De Surmont ['Crimplene' knitters and 'Bri-Nylon' hand-knitting yarn manufacturers], Peter Beazley (right), general manager ICI (Europa) Fibres, and Fred Thomason, EEC commercial manager ICI (Europa) Fibres
4 Mr John Townsend, ICI director and chairman ICI (Europa) came to the gathering after a meeting the day before of ICI (Europa)'s sales chiefs in the Brussels headquarters of the company
5 M. Francois Nadaud, manager, Chemicals Group, I.C.I. France, and SOPRA director, with M. Pons, left, purchasing manager, SALPA, main French makers of synthetic leather soles and major producers of polyurethane foams and PVC flooring

I.C.I. FRANCE MOVES HOUSE

Behind the growth of I.C.I. France lies the skill and energy of many different people, concerned with a wide range of products, problems and policies. We asked some of these people, shown here, to talk briefly about their work in a France that is rapidly industrialising – and about themselves.



'In a factory, high productivity is essential. You simply must make the largest number of things in the shortest possible time at the lowest possible cost. But in the office, this idea is still relatively new, although I try to apply it in the work of my department. No-one should ever need to work after office hours, for example, if we plan the operations properly.'
Head of the plasticisers section of I.C.I. France since 1963, **Jean-Louis Ducasse**, 45, is a technician with thorough experience of fabricating PVC products who later became a salesman and put his production knowledge and outlook to good use.
'With three representatives, I look after the sales of all our plasticisers and chlorinated paraffins, made at Baleycourt Works, near Verdun. There are some strong competitors, but we lead in chlorinated paraffins – sold mainly to plastics (PVC) transforming industries in France as an extender for plasticisers. We were the first to introduce them to this market about fifteen years ago.
Half my time is spent outside this office, dealing with commercial or technical problems. It's contracts and prices I'm concerned with most. With the very big tonnages we sell, a drop of one or two centimes per kilogram of product can make quite a difference. As a rubber engineer who has worked in plastics, I also handle technical enquiries now and again too. Customers, knowing my background, freely discuss their technical problems with me.'
Off duty, he reads serious, well-informed papers like *Le Monde*, and the leading French management journals: 'I read enormously – most of my spare time is spent in learning about political and economic problems. But I also enjoy relaxing at weekends.'



'When I joined this company,' recalls **Marcel Desfloquet**, a chemist who has managed the dyestuffs side of the business since February 1965, having previously been in chemicals and plastics, 'there were only fifteen of us and I dealt with almost every industry. Nowadays we're much bigger but there is also much more competition too – from the Swiss and the Germans especially in dyestuffs, and from one or two big French companies in rubber chemicals.' He and his staff sell dyes to the textile industry, pigments and resins to the paint and ink industries, and rubber chemicals and polyurethanes to manufacturers of refrigerators and cold storage installations.
His origins with the company go back to the days of Ets. S. H. Morden et Cie, whom he joined as a representative in July 1947.
'In dyestuffs,' he says, 'the English have often been accused of being conservative but I believe the French are even more so. I am on the move a good deal, visiting customers in the main marketing areas of France for dyestuffs – the north, the east, and the area round Lyons on the Rhône, a centre of textiles activity.'
The eighteen representatives under his control deal with several different industries: dyes, textiles, ink, and paint (of which the Paris area alone takes 50 per cent of all I.C.I. France sales). He has special responsibility for IMI's titanium alloys, in particular titanium for the French aircraft industry. Born in Lorraine, the famous coal and steel province of France to the east, he is married with three sons. A keen tennis-player, he often has a game on the office court which can be seen behind the main building shown on our front cover.

'Sometimes the voices can be difficult – and the different accents from various parts of France – but we soon learn the work of one department, we get used to the people and the many different chemical terms.' Audio-typist **Mireille Degardin** joined I.C.I. France in March this year. She enjoys the variety of work that comes on to her desk in a busy sales office. 'It is a very interesting job. The representatives, and some of the department heads, dictate their correspondence on tape and we type it off. We also type out summaries and reports of visits to customers all over France.'
With two grown-up children, she works hard cooking and running her flat, not far from Clamart, especially on Saturdays and Sundays. Almost every year she and her family escape from the pressures of Paris life to Perigord down in the middle of France, a rich, gentle countryside where 'nobody ever runs. You never see anybody running. When I'm there with my husband, we fish for gudgeon in the rivers and streams, and we play bowls, because everything he does, I like to do, too. I have a passion for castles, and we have seen many, both in Touraine and in the Dordogne. Castles take me away from the crowds. Driving – especially in the country – relaxes me.
'We always go away in June, when everything is green and beautiful and there are fewer people about. Down there one eats so well – paté de foie, truffles, and other good things. That's where I shall retire – with a small house and a little piece of land.'





'We import products and send them out to customers all over France, handle all Customs formalities, and get the lowest price we can for warehousing, handling and transport. There are hundreds of papers and documents to fill in when you clear Customs – so much so that we recently took on two trained people for the work – one at Persan-Beaumont – the I.C.I. France depot 20 miles to the north of Paris, and the other one at Tourcoing. Their appointment has helped a lot. When Customs introduce a new regulation, you often have to carry it out within 24 hours.'
At 54, **Victor Salem** has worked 37 years for ICI all told, beginning with ICI (Egypt) in Cairo back in 1932, where he was in accounts and then in dyestuffs sales until expelled from the country at the time of Suez. 'I am still,' he says, 'in my short trousers, mentally, having worked so long in warmer lands.'
Arriving in France with few resources, he had to start his business career all over again. Today, as head of the distribution department of I.C.I. France, he controls the receipt and despatch of many different kinds of goods all over a country two-and-a-half times the size of the UK.
Formerly a keen swimmer, he finds this less appealing in a more northerly climate, now spends most of his spare time playing billiards or fishing in summer.
He holidays in Italy with his brother, who has a stocking business.



'The product is so highly-processed that teamwork at all stages is vital. Two things above all help in this job of selling fibres: my business connections in the north, and the knowledge I have gained, both from training and experience, of the way various fibres are prepared for uses in textiles. And I'm on first-name terms with about half my customers, which opens a lot of doors. Maybe it doesn't clinch a deal – but it helps a lot.'
A qualified textile engineer, **Dominique Masse**, 32, has deep roots in the north of France and in its textile industry.
After three years at the Technical Institute in Roubaix, he went on a two-month course to Israel and later worked for six weeks as a trainee in the Dyehouse of Dyestuffs Division at Blackley, Manchester.
In 1966 he joined I.C.I. France's office at Tourcoing, near the Belgian border, as a representative in the Fibres department. He looks after 'Terylene' and nylon fibres and continuous filament yarns. 'We are in close contact with most of our clients – and equally close with experts from Paris and from England, without whom we could not do anything.'
Married with one small girl, Dominique Masse plays tennis and golf, and often drives into nearby Belgium with his family for a short break, either to the coast or into the rolling wooded hills of the Ardennes countryside. 'There are small rivers which one can explore in canoes.'



Since December 1968 **Louis Desgranges**, 41, born in the Oise Department, has worked in the warehouse of I.C.I. France at Persan-Beaumont outside Paris, dealing mainly with the many types of titanium alloy sold by I.C.I. France for IMI: 'The metals I look after are used in aircraft manufacture – including Concorde of course – and the chemical engineering industry and have to meet very high standards of quality and safety in performance. We handle about a dozen grades of metal, with different shapes in each grade – rods, round bars, square bars, tubes, sheets and so on. Since titanium is so expensive we pack it very very carefully to avoid any chance of damage in transit. Some of this alloy is also used in the engines of the French 'Mobilette' powered bicycles because it is so light.'
A fully-trained chef, Louis Desgranges' first love was cooking, and he keeps his hand in whenever he can at home. 'I left a trade I liked very much, but for family reasons I had no choice.' Married, with a young family, he likes to take over the kitchen now and then. His favourite dish is pepper steak. This must, he insists, be cooked quickly so that the steak stays red in the middle. His general advice to cooks is 'If something is strong, something else must be weak,' so he serves his steak with green beans very simply done. He is also a keen do-it-yourself man.

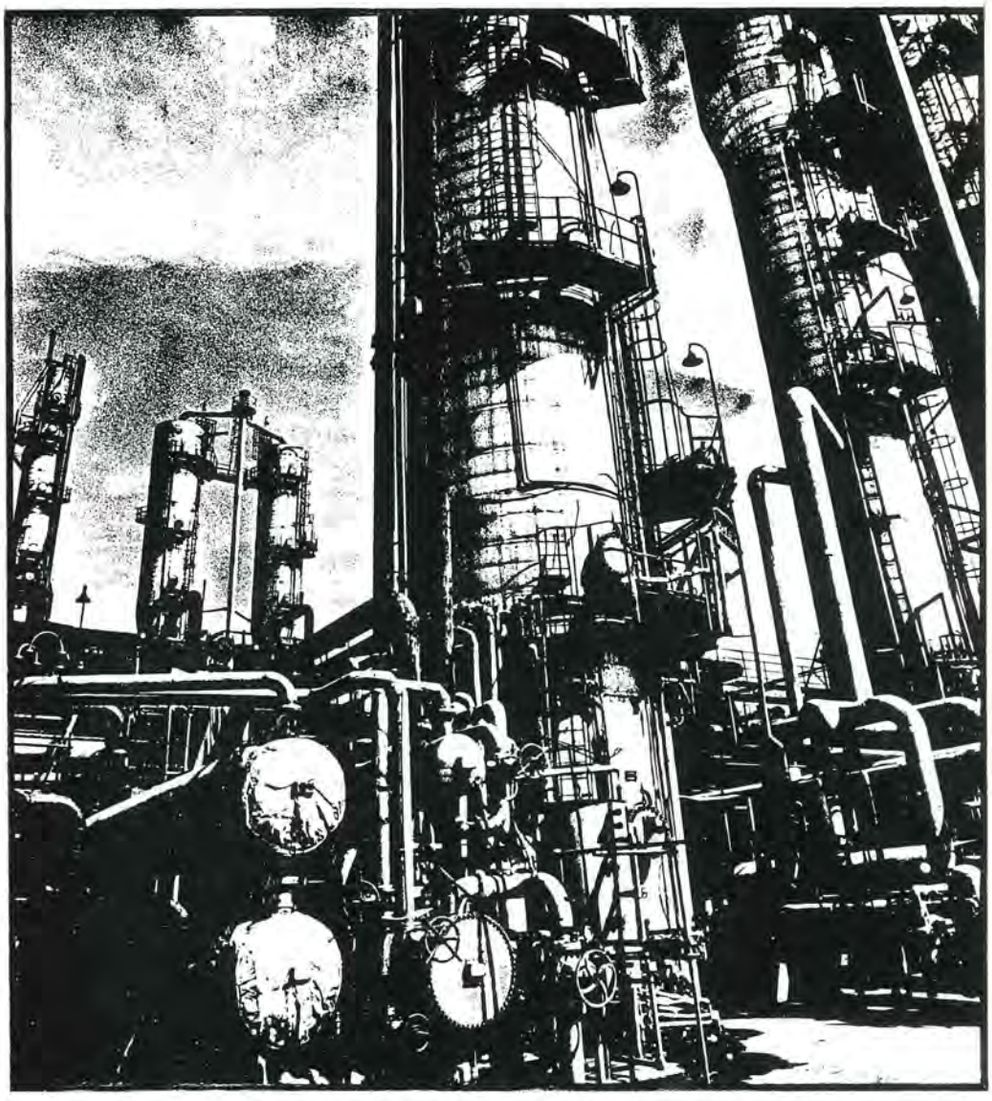


'I have worked in three different I.C.I. France offices: in the Avenue Victor Hugo, at the Rue Ampère, now here at Clamart. There's a big improvement in the premises here, the offices are more comfortable to work in, and better planned. It is a great change, and for the better, but I sometimes miss the old family atmosphere of those earlier days when the company was smaller. Now that we are bigger we specialise more, while then we did a little of everything.'
An import and stocks clerk in the chemicals section of the Distribution department, **Jeannine Dodoz** has worked for I.C.I. France since September 1952. 'My job is to book orders in England for our principals, following right through to the invoices.' At the moment, keenest demand, she finds, is for wallpapers and wallcoverings, especially 'Vymura', which sells well in France against keen competition. 'Apart from wallpaper, I also deal with imports of propylene, ethylene and amines.
At first, the chemicals industry seems so big, so boring, but there is a lot of interest in the many different products and how they are used.'
For her, the move out to Clamart has made the journey to work easier: she lives south of Paris and drives to the office every day. Before, she used to spend 80 rather tiring minutes in the Metro every day. She and her husband greatly enjoy classical music in their spare time, listening to their collection at home. But this year, the two-hundredth anniversary of Napoleon's birth, they have been swotting up on Napoleon for a competition in the Paris newspaper *L'Aurore*. 'There are 32 questions and we think we have 30 of them right!'
She holidays in Burgundy, where her husband was born: she herself is from Lille.

the challenge of change 4

agricultural division

'Big' in the chemical industry has never meant 'static' and it never will. This applies equally to the scaling-up of production, the increase of turnover, or the treatment of people. Agricultural Division is the biggest ammonia producer in the world; one of the largest producers of methanol; the biggest manufacturer of carbon dioxide in Europe; the only UK producer of urea, and one of the world's largest makers of pelleted catalysts. All these advances have demanded not just one adjustment to change but a whole series, with new materials to use, new methods to adopt, new markets (or bigger shares of old ones) to go for. How many organisations as big and complex as this Division, with 24 main products, 15,000 people, 17 plant locations, have had three different feedstocks for their main production process inside ten years?



Ray Pennock, Division Chairman



'No other Division depends so completely on a single material as we depend on ammonia', stresses Ray Pennock, Division Chairman since March 1968. 'Few of the principal products made by the Agricultural Division on the Billingham site could be made without it. The raw material for this ammonia has changed and is changing again. At the beginning of the sixties we were based on coal. Then we moved into naphtha. By the end of the sixties we shall be into natural gas.'

Faced with rising coal prices and fierce competition from foreign ammonia the Division had to change its feedstock to stay in business. Ammonia was becoming available in the Caribbean, North Africa and the Middle East from cheap natural gas and its bulk transportation was becoming a viable proposition. In the very early fifties it appeared that heavy fuel oil or perhaps crude oil itself would have to provide the carbon source, and a Texaco gasification process was installed in a plant which is still in operation.

But before this plant could come on stream it became evident that naphtha would presently become available in sufficient quantities and at low enough prices to make it an attractive alternative if a steam reforming process could be developed to use it. No such process was known. The Division, therefore, turned to its laboratories and in the fifties came up with its renowned steam-naphtha reforming process to make the gas needed to produce ammonia. Plants belonging to the age of coal were swept away and replaced during the years 1958–1966. Five single-stream ammonia units were built with a total capacity of 1·3 million tons a year. Within ten years, the total capacity of the Division went up three times.

The sizes of these plants have grown enormously, says Ray Pennock: 'At the beginning of the sixties we still had a few 50,000-ton ammonia plants in various parts of the country. Today, our plants have capacities up to 300,000 tons a year. New plants now being built in other countries are more than half as big again. Small plants can no longer be economic.'

As a result, the smaller plants were closed in the sixties. It was not only a question of making more ammonia on a given site with a more efficient process. The new plants had to be sited in the best possible places for exporting, too: 'Those small plants, none of which was on deep water or even near a port, were a legacy of wartime home requirements. Today we not only have to make our plants larger in capacity; we have to build them with access to water so that we can import our raw materials and export our finished products as easily as our international competitors.'

The Division was in the forefront of these worldwide developments in ammonia technology and the three big units at Billingham were the first to be designed. Solving all the problems of this breakthrough in technology has involved an immense amount of work, but it is producing a

double benefit in rewards from licensing abroad as well as from cheaper ammonia at home.

More from the operator

The movement to large single-stream plants has involved changes in the organisation of personnel almost as radical as the technical developments.

On the large modern plants there are fewer employees, fewer supervisors and greater individual responsibility. The operator of the sixties and seventies must understand the complex processes which are governed by his operations. He must be able to take corrective action quickly – often without supervision – and his action must be the right one because mistakes can be incredibly expensive. In some parts of Agricultural Division a new career is opening up for the 'O' level recruit, not only in the laboratories, but also in factory operation.

Operational maintenance, too, has seen great changes. The number of maintenance men required when a large single-stream plant shuts down is vastly more than the plant could occupy when it is running normally. The Division has therefore been driven to a large degree of centralised maintenance – a pool of highly-competent craftsmen backed by the best modern equipment.

He's got to be a manager

If today's demands on the operator and craftsman are tough, they are equally tough on the manager. Today's young manager requires all the technical ability of his predecessor plus a lot more skills as well. The sternly-competitive background of modern business demands more planning, better utilisation of resources, better management and more cost-consciousness.



A 17-ton capacity bulk liquid carbon dioxide tanker is loaded at Billingham by George Nicholson. The Division is the largest producer of CO_2 in Europe and supplies over 80 per cent of the liquid CO_2 used by nuclear power stations in the UK

It is not surprising that the burst of training and retraining which has gone on in the sixties has applied to managers also. In the last three years almost every manager in the Division has been on a general management course at the Division's own Training School to help him use his resources more effectively.

Two kinds of ICI business

Ray Pennock points out: 'There are two aspects to our business. We sell finished fertilizers which account for about two-thirds of our turnover, and the rest are industrial chemicals, mainly intermediates for conversion by other manufacturers. These include methanol, urea, nitric acid, sulphuric acid, catalysts, nitrate of soda, and sodium nitrate. About half of these are sold to other Divisions of ICI. We also provide liquid carbon dioxide for nuclear power stations and the solid CO_2 of 'Drikold'.

'With such industrial chemicals large contracts frequently extend for several years. It is here that quality of product, high-grade service and reliability of delivery are paramount. If you don't supply the product in the right place at the right time the manufacturing operations of your customer just stop. Our CO_2 drivers, for example, have battled across the Pennines through snow and ice when most other traffic has stopped – but deliveries have always arrived on time.'

Marketing – then and now

The manufacturing changes reflect the outside world in which the Division has to fight for its profits. During the last ten years the Division has moved – in fertilizers – from an era of allocation and market development into one of intensive competition at home and abroad. 'Back in the fifties, there was a constant shortage of products and much of our effort was concentrated into building up the demand for fertilizers in general. We did this by demonstrations, costed farms and a whole range of services to the farmer.

'Today, the British farmer, when he uses the right level of fertilizers, has become one of the most competent in the world. So while we still do an immense amount of education and servicing of the farmer, at the end of the day we want him to use *our* products.' In the United Kingdom fertilizer is not a glamour business, Ray Pennock points out, but it is reliable growth business. The farmer cannot do without fertilizers and he can readily see a return of £2 to £3 for every £1 he spends on them.

Internationally, the growth rate is more dynamic, expanding by 12 to 13 per cent a year. Here, too, the Division comes up against sharper competition from Europe, Japan and the USA, the world's leading producers.

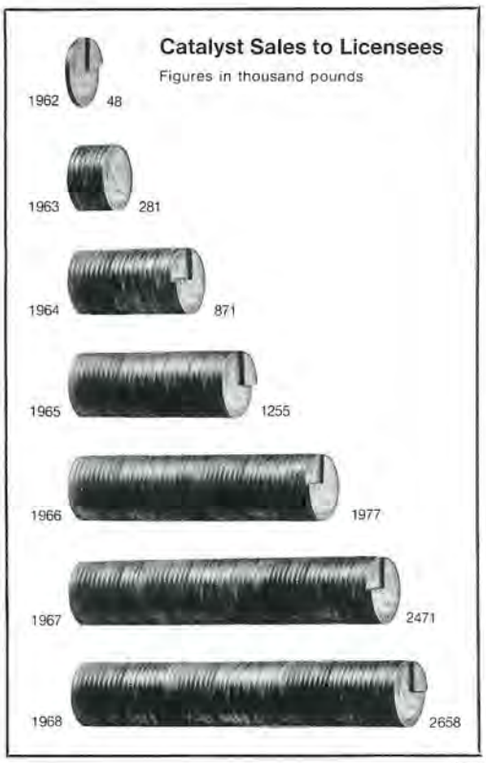
In the developing countries, and particularly in such areas as India, Ceylon, China and the Far East, the demand for fertilizer plants is following the growth of imported products. 'Actual production from the land is rocketing in some of these countries, where new strains of wheat and maize are being developed. Most of the demand is for straight fertilizers (nitrogen only), such as sulphate of ammonia and urea. Since fertilizers are so vital to the economies of these buying countries, agencies are often sponsored by the governments concerned. The Chinese, for example, have the biggest such agency in the fertilizer world.

'Our big contract every year, which sets the ball rolling, is usually with China. China buys half a million tons at a time – not all from one supplier of course. Then we do a lot of business with India, where we have to compete with the Americans and with other European manufacturers countries too – on price, on service, and on availability of products. With many of these national customers abroad, the time comes when they want to build their own plant, often sponsored and helped by us. Here we help in two ways – building the plant and licensing our processes. We go into the market to build up demand to encourage them to build their own plant.'

Selling their brains

Almost all the processes of the Division have been developed in its own research department, which has a striking record of success all over the world through sales of knowhow. It has two products: chemicals and ideas. It sells them both.

The outstandingly successful technology for the steam reforming of hydrocarbons, especially of liquid naphthas, has enabled the UK Gas Boards to bridge the gap between coal-based gas and North Sea's natural gas. The same process has been sold in 26 other countries to



the challenge of change 4

agricultural division

make town's gas and synthesis gas. The Division's ammonia and fertilizer technologies are also being licensed in selected areas while the Division's new L.P. methanol process looks like being another world success. Two very big plants in the USA and smaller ones in Korea and Taiwan have already been ordered from licensed contractors and more are under negotiation now.

'These sales of knowhow,' Ray Pennock points out, 'have brought in over £15 million in the last six years. They represent a splendid spin-off from research, a spin-off which will more than pay for all the research of a whole decade and leave the Division's own applications effectively "free-of-charge".'

In the Division's factory at Clitheroe, Lancashire, the manufacture of catalysts is another success story. It also depends on research and licensed processes. A workforce of 300 in rural surroundings turns out 27 different catalysts. Of these, 17 are used within ICI – mainly by Agricultural Division for ammonia and methanol and by Heavy Organic Chemicals Division for plasticiser alcohol production and ethylene purification – and all are sold to the chemical industry throughout the world. It was the steam-naphtha reforming process, demanding principally two specialised catalysts, which made most of this business possible.

Plant Protection – a new momentum

There is no better example of effective research and imaginative marketing than in the world-wide operations of Plant Protection Ltd, the part of the Agricultural Division responsible for crop protection chemicals. The research stems from Jealott's Hill Research Station in Berkshire, and the marketing is controlled from the headquarters at Fernhurst in Sussex.

The growth in turnover and profit of Plant Protection has been dramatic. 'It's the new products that have really transformed the scene' Ray Pennock emphasises. 'The bipyridyl herbicides 'Gramoxone' and 'Reglone' are sold in well over 100 countries and, for example, are doing just as well in the USA as in Western and Eastern Europe and the Far East, because these ICI discoveries are products unmatched by any competitor.'

Behind the bipyridyls are now coming a new family of crop protection chemicals, the pyrimidines, which are already showing great promise. Two of them act as systemic fungicides: one controls mildew in glasshouse cucumbers and is being sold commercially; the other, in a late stage of development, is giving excellent control of powdery mildew on cereals. The search for still more products in the pyrimidine group is being energetically pursued; but, of course, Plant Protection are not just interested in these fungicides, there are new insecticides and weedkillers now being actively developed too.

This is the most international part of the Division's business. 'Over the last five or six years the personnel of Plant Protection must be some of the most travelled in the Company, building up markets and developing an international network of first-class agents. All this time the Plant Protection board have been planning the direction and further growth in the seventies; and they have just appointed an additional managing director, a new research director, and a planning director.'

Prospects and profits

Because of all these changes in the Division, Ray Pennock finds, 'Everybody is more profit-conscious, more conscious of the need to know how profits are made, and how they personally can help those profits. Most people are beginning to understand that better profits bring better wages and conditions — and without good profits further expansion and the security which goes with it cannot be sustained.'

While change in the seventies may not keep up the pace of the last few years, it will certainly, in Ray Pennock's view, not slacken very much. He sees the fertilizer business expanding at a steady rate – say 5 per cent every year – with growing competitive pressures in the market, mainly from Fisons and Shellstar and also with growing pressures on the consumer. For the farmer, it will really become a question of the survival of the fittest, and the fittest will tend to become a bigger farmer or a member of a farmers' buying group.

Within the Division, the research is extending into new fields, of which the most promising are the food production industry through, for example, the manufacture of proteins from hydrocarbons, and the production of non-protein nitrogen for animal nutrition. New catalysts and laminated building products are also expected. In production, streamlining will go on – a streamlining that will concentrate energy and ability and resources more and more effectively. Productivity has risen by about 10 per cent in every year since 1958.

'The chemical business expands at twice the national average rate, so life is always going to be changing. We can either grumble and resist changes as they are forced upon us, or we can say: 'let us control them by thinking and planning ahead – let us be in charge of change instead of change being in charge of us'.'



Control room operator, Dennis Simpson, in the Low-Pressure Ammonia Plant control room, where advanced equipment used to monitor and control plant operation includes a closed-circuit television set linked to cameras viewing the level gauges of the steam drums on each of the three ammonia units 120 feet above ground level. Right: about half a million tons of fertilizer is exported each year from the river Tees. Here Billingham urea fertilizer is loaded for Cuba at Tees Dock



Above all an ammonia producer, with a capacity of 1·5m tons a year, Agricultural Division directs 75 per cent of its ammonia into the fertilizer market at home and abroad. About half of the three-and-a-half million tons of products despatched every year is for agricultural use. Fertilizer sales in the UK include the nitrogen fertilizers 'Nitram' and 'Nitro-Chalk', concentrated complete fertilizers containing nitrogen, phosphate and potash and intermediate products such as ammonia, and urea for use by other fertilizer manufacturers. Urea and ammonium sulphate are exported. UK sales of fertilizers are external to the Company except for about 15 per cent of the total to the Division's subsidiary companies, Hargreaves Fertilisers Limited, Richardsons Fertilisers Limited, Richardsons (Ulster) Limited and Scottish Agricultural Industries Limited. Through them the Division has total coverage of the UK fertilizer market. About a quarter of revenue comes from products sold within ICI. Dyestuffs, Mond, Nobel, HOC, and several other Divisions, to a lesser extent, depend on Agricultural Division for products such as ammonia, methanol and hydrogen. These products are used as intermediates by the other Divisions and result in a very wide range of consumer goods including nylon, 'Terylene', plastics, paints and explosives. Sales of nitric and sulphuric acid to Dyestuffs, Mond and Nobel Divisions are supplementary to their own manufacture. The Division does very little shopping within the Company, the only major item being one million tons a year of naphtha, imported through Heavy Organic Chemicals Division. Polyurethane chemicals from Dyestuffs Division are used in making laminated building products. Mond Division makes bipyridyls for formulation and marketing by Plant Protection Ltd who are responsible for the Division's crop protection chemicals, a rapidly expanding international market. *Map: F. H. Reitz*



Agricultural Division

Headquarters ● Factories and products ★ Sales offices

Sources of main raw materials within the Company

IN ➡ **Heavy Organic Chemicals Division** — Naphtha
Dyestuffs Division — Polyurethane chemicals

OUT ➡ **Dyestuffs Division** — Ammonia · Methanol · Hydrogen Nitric Acid · Urea · Sodium salts · Formaldehyde · Sulphuric Acid
Mond Division — Ammonia · Methanol · Sodium salts Formaldehyde · Sulphuric Acid
Nobel Division — Ammonia · Methanol · Nitric Acid · Sodium salts
Heavy Organic Chemicals Division — Ammonia Methanol · Sulphuric Acid
Paints Division — Nitric Acid · Urea · Sodium salts · Formaldehyde
Plastics Division — Ammonia · Sodium salts
ICI Fibres Ltd — Methanol · Sulphuric Acid

Sources of raw materials other than ICI

Sulphur — France, Poland, USA, Mexico **Natural Gas** — North Sea
Phosphate Rock — Israel, USSR, West Africa
Potash — West Germany, East Germany, France, Spain, USSR, Israel
Naphtha — Throughout the world **Coal** — Durham coalfield

Note: The arrows point to or from the headquarters of the Divisions and not necessarily the actual sites of the factories


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ICI on the farm

You can't go far on any modern farm without coming across an ICI product – on the soil, where the Company's fertilizers have helped British farmers to reach record levels of productivity; in the dairy and the pastures, where pharmaceutical products help with animal hygiene and general health; in buildings, equipment and machinery, where plastics and synthetic fibres of various kinds play an ever-increasing part. ICI is quite a farmer in its own right too, with 4500 acres directly farmed by Agricultural Division for developing and assessing systems of farming which use the Company's products profitably.

Our numbered picture shows just where many of these applications can be found.

Divisional code
A – Agricultural; **F** – Fibres; **M** – Mond; **PL** – Plastics; **PH** – Pharmaceuticals; **P(H)** – ICI (Hyde) – part of Paints Division; **PPL** – Plant Protection Ltd.



ANIMALS: feeding, hygiene, health

1 Feeding-stuffs: various ICI products are used in animal feeding-stuffs to provide needed proteins and minerals. These include mineral supplements for beef and dairy cattle, pigs and poultry, and urea as a source of non-protein nitrogen in 'Biostock', easily converted to protein by cattle, sheep, pigs and goats. **PH, A**

2 Animal medicines and treatments: to prevent and destroy all types of intestinal worms and liver flukes, or tape worm segments, farmers can choose the relevant product from the following: 'Nilverm', 'Nilzan', 'Zanil', Pig Wormer, plus the traditional 'Phenovis' or 'Minel'. In epidemics of foot-and-mouth disease, a 4 per cent solution of soda crystals is recommended by the Ministry of Agriculture for decontamination. **PH, M**

3 Branding cattle: 'Drikold', ICI's CO_2 (at −100 °F) offers a simple, effective means of branding cattle. In 30 seconds the branding-iron at −100 °F kills hair pigment cells. Hair later grows again, white, giving large, clear letters and numbers. **A**

4 Hygiene: for mastitis control in the dairy there are ICI Udder Wash Super concentrate; the newest dip, 'Teatcote' Plus, and ICI Udder Cream, all of which protect cows against mastitis. **PH**

5 Sheep Dips: ICI Fly and Tick Dips and 'Mountdale' Sheep Dip are dips based on the insecticide 'Diothyl' which they also make. **PH**

6 Stopping horn growth: when calves are very young, horn buds can be treated either with caustic soda or caustic potash, which prevents horns from developing. **M**

7 Dairy hygiene-equipment and buildings: 'Chloros', ICI Circulation Cleaner and ICI Dairy Detergents, clean and sterilize dairy equipment. **Made by M, sold by PH**

8 Greenhouse coverings: Polythene film made from 'Alkathene' is used as a greenhouse covering. Much cheaper than glass, it admits just as much light. PVC film made from 'Corvic' and 'Welvic' is used for the same purpose; 'Transpex' acrylic sheet is being used as a more permanent glazing material. **PL**

9 Growing covers: Polythene film is also widely used for temporary coverings and screens to protect growing plants. **PL**

10 Linings: livestock houses and milking parlours are lined with 'Darvic' rigid vinyl sheet to improve cleanliness. **PL**

11 Insulation: 'Purlboard', the laminate in board form, made from rigid polyurethane foam, insulates livestock buildings, encourages rapid, healthy growth. **A**

12 Roofing: corrugated PVC roof sheeting – tough, durable, resistant to weather – provides roofs and walls for farm buildings. Polythene film is also used for roofing and to make low-cost shelters for livestock. 'Sintilon', highly-transparent corrugated rigid vinyl sheeting, is tough, durable, and weather-resistant. It has many roofing and cladding uses. **A, PL, P(H)**

13 Roof lighting: light and strong, sheets of 'Perspex', 'Darvic' and 'Sintilon' admit maximum daylight. **PL, P(H)**

14 Netting: made from 'Maranyl' nylon supports plastic films used for greenhouses and shelters. **PL**

15 Windbreaks: made from 'Alkathene' polythene and 'Propathene' polypropylene are light, strong and quickly erected. **PL**

CLOTHING

16 Clothing: nylon overalls last three times as long as cotton and are much easier to wash and dry. There are also overalls in 'Terylene'/cotton and protective garments in coated nylon. **F**

CROPS – production and protection

17 Fertilizers: ICI's range has been developed to meet almost every farming need. Some are straight nitrogen fertilizers ('Nitram' and 'Nitro-chalk'). Others are special compounds. **A**

18 Compound fertilizers: made up to suit a wide variety of crops, and contain differing mixtures of nitrogen, phosphate and potash. **A**

19 For fruit trees, 'KayNitro' 25, combining nitrogen and potash, is most effective. **A**

20 Sugar beet fertilizer: 'Betrox', ICI's special grade of rocksalt, is a direct sodium fertilizer for sugar beet. It increases both the yield of beet and its sugar content. **M**

21 Seed-dressings which kill insects and fungi in cereals, sugar beet, and the cabbage family, especially wireworm, wheat bulb fly, and seed-borne disease, include ICI's 'Agrosan'; 'Mergamma'; 'Gammalex'; and 'Saphizon'. All are sprayed on. Revolutionary systemic fungicide, 'Milstem', controls mildew on cereals. **PPL**

22 Deadly killer of all green matter is the bipyridyl herbicide 'Gramoxone' which interferes with the action of light on the plant, stops operating when it touches the soil. Used in potatoes, sugar beet, beans, strawberries, most row crops, also in top and soft fruit and in forest nurseries. Increasingly used to kill old grass, weeds, and stubble of previous crops, both to help ploughing and also to make it unnecessary, forming a dead mulch through which direct drilling and seeding can take place. A revolutionary new approach to farming. 'Agroxone', 'Methoxone' and 'Fernoxone' selective weedkillers control broad-leaved weeds in cereals and grassland. Various insecticides and fungicides for spraying fruit trees include 'Captan-Col', 'Delan-Col', 'Ferna-Col', 'Gamma-Col', and 'Saphi-Col'. **PPL**

23 Woodland maintenance: to control unwanted growth in woodlands, e.g. small trees and shrubs, 'Trioxone' spray is a powerful deterrent. **PPL**

24 Even under water in ponds or lakes, 'Reglone' kills weeds. **PPL**

25 Products for feeding glass-house plants and controlling pests and diseases – 'Solufeed', 'Sistan', atomisable fluids and smoke generators. **PPL**

DRAINAGE AND IRRIGATION OF LAND

26 Land drainage: pipes made from 'Corvic' or 'Welvic' PVC resist corrosion, are easily installed and have a long working life. 'Alkathene' polythene is also used for the same purpose. **PL**

27 Water for farms: Plastics tubing and pipes – 'Propathene', 'Alkathene', 'Corvic' and 'Welvic' – carry water supplies for general farm and greenhouse use. 'Alkathene' is used for storage tanks and drinking troughs. **PL**

28 Irrigation and husbandry: pipes made from 'Alkathene' are used for water supply to fields and outer areas. **PL**

EQUIPMENT – various smaller aids to growth; poultry; transport

29 Mulches: black polythene film made from 'Alkathene' is used for mulching growing crops. **PL**

30 Produce boxes: in 'Propathene' are light, clean, durable. **PL**

31 Poultry crates: in 'Propathene' are both light and strong, and easily stackable. **PL**

32 Plant pots: made from 'Propathene' are light in weight, easily transported and stored, and impervious to water. **PL**

33 Sacks: for dozens of purposes on the farm, in 'Alkathene' have many advantages: they are strong, light, rotproof and last much longer than conventional sacks. **PL**

34 Tool handles: moulded from 'Propathene' last better, stay smooth and will not splinter. **PL**

35 Crop and silage covers: Film made from 'Alkathene' is used to cover silage. It is also used in constructing potato clamps and in general crop storage. **PL**

36 Storing water: film made from 'Alkathene' can be used to form a waterproof lining in water storage containers. **PL**

37 Wire fencing: coated with 'Corvic' or 'Welvic' is well protected against rust and weather. **PL**

MACHINERY, MACHINE COMPONENTS

38 A special range of machinery has been developed to apply 'Gramoxone' and other techniques – 'Vibrajet', 3-D drill, 'Plantector' Seed Treater, 'PP' Knapsack Sprayer. **PPL**

39 Machinery components: inside milking machines, as components, mouldings in 'Maranyl' nylon are strong, hard-wearing, damp-resistant. **PL**

40 Machinery components: V-belts inside farm machines such as threshers, combine harvesters, based on 'Terylene', are tough, strong and long-lasting. **F**

41 Seed-drills, too, have components moulded from 'Maranyl'. **PL**

SOIL TREATMENT

42 Large quantities of lime in powdered form are sold to farmers, who spread it on their soil to correct acidity. **M**

Alex Ames

all on the surface

Polyurethane chemicals are used in new types of protective coatings for floors which have to withstand particularly hard wear, like this floor (above) in a busy area of Hexagon House, Dyestuffs Division headquarters in Manchester, and (below) a decorative seamless floor in a hotel bar



One of the problems that bedevils the hostess is the incurable habit some people have of putting down a glass on a polished wooden surface. Those tell-tale rings which develop from whisky, gin, or other drinks generally defy furniture polish and elbow grease alike. Since people cannot be constantly calling in french polishers to repair the damage, scientists have in recent years been grappling with the problem of creating a surface which can resist the worst a careless person can do to it.

The polyurethane chemicals developed by these scientists for surface coatings have achieved striking results in a relatively short time. It would hardly be too much to say that a new era for furniture has dawned as a direct result of the work they have done. From the Research and Technical Service Laboratories of Dyestuffs Division at Blackley has come a series of

products from which surface coatings can be made that give excellent protection against the most destructive conditions.

These raw materials are now freely available at reasonable prices and in consequence are finding more and more outlets. Today, the Division can offer a range of polyurethane chemicals from which formulations for wood, metal, paper, leather, rubber and textile finishes, both protective and decorative, can be prepared.

British manufacturers have been slow to see the advantages of furniture treated with these non-mark, non-scratch surface coatings, but Dyestuffs Division has scored notable successes with them abroad, where the potential customer seems much more willing to try something new. Sweden, France, Italy, Spain, Australia have all provided important markets. In Japan, these coatings are being used not only as furniture finishes but to protect metals.

Great interest in metal protection has been aroused in engineering and shipbuilding industry, particularly in Japan, by polyurethanes combined with an epoxy resin to give high-performance coatings. With coal tar pitch, this gives better resistance to water and to chemicals.

If the Forth Bridge could be stripped down to its metal and protected with a polyurethane surface coating, the endless business of painting it could undoubtedly be scrapped. Some day, structures like the Forth Bridge may well be protected with urethane compounds. When they are, the Division will be ready to supply the raw materials for these compounds.

Polyurethane-based lacquers used to protect the interiors of metal containers are already showing what can be done. This ensures the safe delivery of many reactive products to customers at home and abroad.

While the search for commercially attractive polyurethane coatings continues for such materials as paper, leather, rubber and textiles, progress has been made in flooring – progress which could substantially change household fittings. This is the use of polyurethane chemicals to prepare new types of flooring for which demand has risen rapidly. Floor, as well as furniture finishes which are not only attractive to look at but which stand up exceptionally well to conditions in canteens, offices, and public buildings have been successfully demonstrated and are in use.

A floor at Plastics Division, which has recently been treated with a Dyestuffs Division polyurethane coating, is a good example of effective co-operation between Divisions on products of mutual interest. In the USA, and increasingly in other parts of the world, polyurethanes are being used in combination with vinyl colour chips as wear-resistant floor finishes for concrete as well as for wood. Since these coatings are seam- and crack-free, they clean very easily and can easily be renewed by applying another clear top coat. These decorative floorings can be made to mix or match with existing decorations by selecting chips of the right colour from the wide range on offer. At present the job has to be done by a qualified contractor who has been taught how to prepare the surface correctly, then to apply the layers of resin in which the coloured chips are embedded: application is not yet for the do-it-yourself market.



Having developed polyurethane coatings for decorative seamless flooring, Dyestuffs Division is now going on to an even more exciting project – the use of polyurethane resins with aggregate to form highly-durable yet attractive industrial floorings. The resin, after mixing with aggregate such as coloured sand, gravel, pebbles, or broken stone, is applied by trowel. Further coats of clear resin are then put on to seal the surface. Like the first system, this flooring is seamless, easy to clean, and resists chemicals well. The use of aggregate in the mixture makes sure that the surface will stand up to very heavy traffic, while the mixture can also be put on thickly enough to cover local unevenness. Old wooden or concrete surfaces can be made safer and given many more years of useful life at a relatively low cost.

What does all this mean in terms of production and sales? The rate of expansion of all surface coatings has gone up five times in ten years. Sales of wood finishes alone have doubled in the last two years, while in the last four years there have been two other outstanding increases. Four times as many urethane surface coatings in factory-finished wood are being sold today, and eight times as many coatings for packaging.

Above: laying down a seamless flooring, using layers of polyurethane resins and chips of coloured aggregate. Below: a polyurethane/epoxy/pitch finish is applied to a Japanese ship







ICI's biggest-ever US investment

'We have acquired 75 acres at Hopewell, Virginia, with another 75 acres on option, where we plan to build a 'Melinex' polyester film plant. This will be our largest investment to date in the United States. 'Melinex' is our trade name for a range of polyester films for which we already have manufacturing plants in Dumfries, Scotland, and Rozenburg, Holland. These films are used in a very wide range of applications, including photographic base for X-ray films, magnetic and pressure-sensitive tapes, metallized decorative products, engineering drafting materials, and electrical insulation.'

With these words Sir Peter Allen, Chairman of ICI, told a recent press conference in New York about the Company's biggest-ever US investment project, a new 'Melinex' plant costing over £20m. After introducing Mr William Duncan (President of ICI America Inc since September 1966) as the new Chairman of the Board and Chief Executive of ICI America Inc, a wholly-owned ICI subsidiary, and Mr D. Gallaher (Vice-President of Canadian Industries Ltd, ICI's Canadian company) as its new President, Sir Peter reviewed ICI's progress in the American market to date.

Among other developments, he mentioned the completion of a new plant on the Bayonne site of ICI America Inc, which has just begun to produce polyurethane speciality chemicals such as those used in laminating textiles; and the fact that production was about to start in another new plant on the same site of PTFE, sold as 'Fluon,' and widely-used where outstanding temperature or chemical resistance, electrical insulation or non-stick properties [as in frying-pans] were needed.

These two plants bring total ICI investment in Bayonne up to £9m. When all new plants now in hand are completed, the Company's total US investment will approach £83m.

'We are planning further expansion in the years immediately ahead,' and I believe it is in ICI's overall interest to strengthen its American base further . . . success in the American market, tough as it is to achieve, brings results that are really worthwhile, and that is why we have started through ICI America to build a major operation here,' he concluded.

Preparing for change

As the Weekly Staff Agreement and the Staff Development Programme are introduced, more and more ICI employees will be involved in solving problems and planning for change through group discussion. For some of them at least this will be both new and strange – and to help them get the most out of their meetings, either as leaders or members of discussion groups, a new film has been produced for Central Personnel Department. It forms part of a 'learning package' which will be available throughout the Company and will also be sold to outside firms and organisations. The package is called – Preparing for Change – and the film, 'A Shift of Opinion'.

Made this summer in only six weeks between approval of the project to final shooting, it covers a 30-minute discussion in a works' conference room about possible modifications to a chemical plant. The discussion is led by a plant foreman and involves eight men who are all concerned with the efficient running of the plant. But in essence the film is not mainly about plant changes, or any other specific problem; instead, it is intended to show how discussion of any topic can bring about changes of attitudes, how a discussion leader can help and control a meeting, and how everyone taking part can contribute to the success or failure of an attempt to reach agreement. It illustrates how a group of people can share a common problem because they have a common objective and shows that they can talk openly and constructively about their differences. In the view of people who have already seen it the film does all these things effectively – and does so informally and with humour.

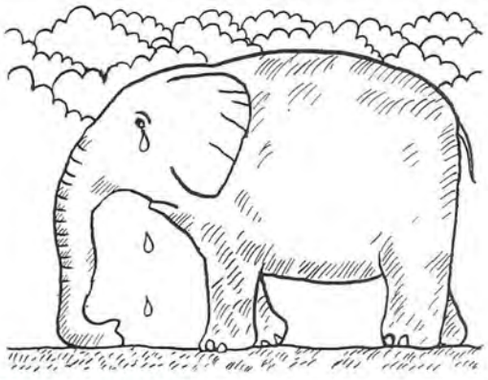
Based on an outline script by Bruce Cooper, an Agricultural Division training officer at Billingham, who writes frequently for the educational press, for literary periodicals and for the BBC, the film will be distributed as part of the package in which the other items will be a brief written description of the film and its main characters, for distribution to audiences; a set of tutor's notes for use on training courses; a set of notes to be used by managers and supervisors when showing the film to their own work groups; a copy of the film script with marginal guidance notes for use in discussions about the film; and a 3000-word booklet on leading group discussion. This also is by Bruce Cooper and is to be published by the British Institute of Management for sale and for distribution to the Institute's members.

Making the film and preparing the remainder of the package has involved a number of ICI people at Head Office and at Billingham, among them Martin Cadman, of Central Management Services Department, and Donald Wilson, who is in Central Personnel Department on WSA liaison work. The film was produced by SB Modules Ltd, who also made three films last year for the 'Assessing Projects' learning package.

'A Shift of Opinion': in this scene from the new ICI film about group discussion the workmates of 'process operator' Arthur Tompkins (left) listen as he makes a point during their discussion of plans to make changes on their plant. All the parts in the film are played by professional actors









Sailing – 'Out in Front'

'Out in Front' – a practical film for the dinghy sailor, has just been produced by Millbank Films Ltd for ICI Fibres Ltd. It demonstrates sailing techniques for getting the best out of 'Terylene' sails and reveals some of the research and development work done by ICI Fibres to improve them.

Sequences show how to make the most of 'Terylene' sails in river, lake, and sea conditions. They feature three popular classes of dinghy: the Merlins of Tamesis, the Enterprises of Grafham Water Sailing Club, and the Fireballs of Hayling Island Sailing Club.

Approved by the Royal Yachting Association, 'Out in Front' should interest and help the vast majority of dinghy men and women. Copies can be had on free loan from the ICI Film Library, Thames House North, Millbank, London SW1.

Artist in ivory

Carson Ritchie's interest in ivory sculptures, about which he writes on page 237, was first aroused about 30 years ago, when as a ten-year-old schoolboy he read a short story about a Chinese ivory carver. In his student days he bought hippopotamus teeth from a bric-à-brac shop in Chelsea and made his first attempts at carving on this hard and difficult material. Later he began to collect Japanese ivories and bought his first elephant's tusk – a broken one – to carve himself. He has now been carving for ten years and buys his ivory direct from the ivory warehouses in the Minories, East London.

Having found that very little is known in this country about ivory carving, Dr Ritchie has now written the first handbook on the subject, due for publication this month by Arthur Barker. He is already working on a second book on another aspect of sculpture.

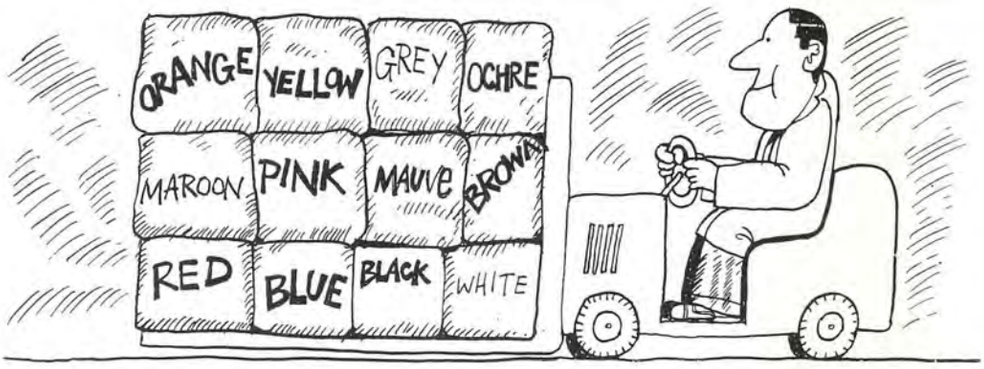
He first began exhibiting his works at shows held by the Royal Society of Miniature Artists and recently went a stage further with a joint exhibition at All Hallows Church in the City, where his sculptures were displayed with the work of Andrew Bray, a young designer in silver.

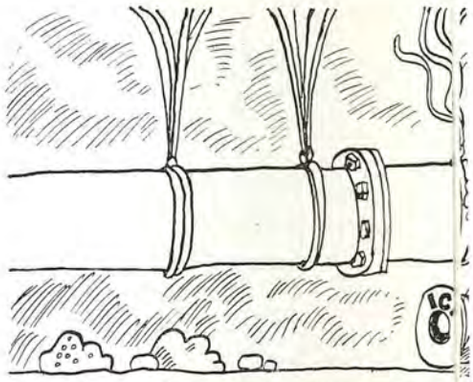
Films sell polythene

Two years ago, Millbank Films Ltd made a film for British Visqueen Ltd, a subsidiary of Plastics Division, on lining reservoirs with plastic sheeting, following it up last year with one on lining canals with the same product. These films really helped BVL to sell their polythene: after seeing them, the Sudan, Qatar, and Iceland ordered materials. Korea, too, placed an order for 9 tons, and the biggest success of all came from Romania, where Taylor Woodrow International, the big civil engineering contractors have won a £20m contract for an irrigation scheme. BVL are to supply 800 tons of polythene for canal linings.

Correction – Dyestuffs Division Readers of the September issue may have been puzzled by the references on pp 194 and 199 to Dyestuffs Division's success in winning the Queen's Award to Industry. The Division has won the awards in three of the four years since they were instituted. On two occasions, in 1966 and 1969, it did so on two counts – technological innovation and export achievement. In 1968 the award was received for export achievement only, which makes the Division a five-times winner to date.

In another reference to the Division, on page 212, Mr W. B. Stead was wrongly described as a Division deputy chairman. He is in fact, personnel director and director-in-charge of Product Group G.





New 'Procion' plant

A new £5m 'Procion' plant at Grangemouth, Scotland, has been completed and brought into operation by Dyestuffs Division in 18 months – three months ahead of programme. The new plant, built to help the Division to cope with growing international demand for these fibre-reactive dyes, will not only help ICI to keep its lead but will assist the UK economy by adding still further to ICI's high level of exports.

Dyestuffs Division is the Company's biggest exporter, with 1968 figures of a record £45m. 'Procion' fibre-reactive dyestuffs have gained a Queen's Award for technological innovation and have twice helped the Division to win Awards for export achievement. The capacity of the new plant, plus capacity at the Division's 'Procion' plant at Trafford Park, Manchester, will enable ICI to meet the foreseeable demands of the home market – and to export more than 80 per cent of total 'Procion' output. Good working conditions for operators, plus a high level of technical interest, are special features of the plant. Mechanical handling and modernised process operations both reduce manual effort, while fume extraction and duct control equipment help to provide a clean, comfortable environment. A high degree of instrumentation enables operators to follow the process closely and control it more effectively.

'Procion' dyestuffs emerged from a sustained research and development programme in the Dyestuffs Division laboratories at Manchester. During the twelve years in which these dyestuffs have been commercially available, ICI has maintained its initial lead. Other manufacturers have ranges of reactive dyestuffs, using chemical systems outside the ICI patents, Dyestuffs Division has stayed ahead and still has the most comprehensive and versatile range of reactive colours in the world.







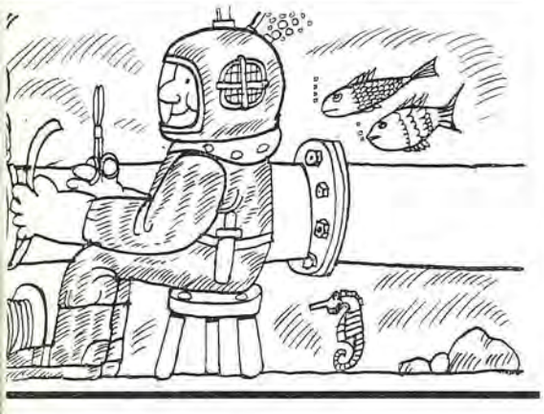


To be ordained

It is not unusual for younger members of laboratory staff at Wilton, or elsewhere in the Company, to leave ICI to continue their higher education – but it was unusual when 22-year-old Neil McNicholas, a laboratory assistant in the Tees-side Works of Plastics Division, said good-bye to colleagues and other friends on the Wilton site. He was leaving to begin an arduous course of training for the Roman Catholic priesthood.

A lab assistant in the Tees-side Works' Propathene Laboratory since he joined ICI four years ago, Neil faces eight years of study and training as he progresses towards ordination as a priest. He will still be able to keep in touch with his Wilton friends, however, for his father, Mr W. McNicholas, works there on Polyolefines research.

Above, far left: Lord Hughes (centre), Joint Under Secretary of State for Scotland, who opened the plant, admires the Rose book, bound in material dyed with 'Procion', given to him as a souvenir by Dr Alan Robertson, Division deputy chairman (right). Looking on (left), is Mr Bill Stead, personnel director
Above, left: employees watch the unveiling. Left: general view of plant



More paid by cheque

Efforts by the various clearing banks and by the Post Office to encourage much wider use of Giro and other banking systems are preaching to the converted so far as over two-thirds of Wilton's 11,500 weekly-paid employees are concerned: they now have their wages paid through the banks, by direct credit transfer.

Payment of wages in this way was pioneered in ICI by a comparatively small group of Wilton men who saw that it offered a number of advantages, particularly to shift workers who sometimes had to travel long distances into the works on their rest days, either to pick up their wages advice notes, or to collect their wages.

Since then, the number of employees paid through the banks has grown in a number of Divisions and works, but nowhere as fast as at Wilton. There just over 8000, or almost 70 per cent, have said good-bye to the pay queue.

Two works with a percentage marginally higher than for the Wilton site are the Davies and 'Terylene' Works of ICI Fibres, where 73 per cent are paid through banks. The figures from these two works have helped to boost the percentage for ICI Fibres as a whole – it is now 36 per cent – and have set an example which Fibres' Kilroot Works in Northern Ireland is following keenly. There 57 per cent of 'payroll' – almost 1000 – have opted for payment through a bank account.

Convenience and security are two advantages of the scheme. Wages go straight into the bank every week, so that valuable wage packets no longer have to be carried around in pockets, pay advice notes are delivered, and an employee who is off sick knows that he does not have to worry about collecting his money – it will be paid to the bank. It will also pay 'standing orders' and carry out other banking services.

'Seaweed' can protect pipelines

Artificial 'seaweed' made from polypropylene tape, designed to protect underwater pipelines at depths up to 20 fathoms has been developed by ICI Fibres Ltd and is being offered to drilling companies in the UK. Tufts of the tape, each held to the seabed at one end, have their free ends floating upwards rather like the fronds of real seaweed, because polypropylene tape is lighter than water.

Effect of a 'bed' of this artificial seaweed – originally developed to try and combat coastal erosion for which large-scale trials are in hand – is to change the wave pattern and remove some energy from the waves, so that small particles of water-borne material such as sand are deposited round and among the tufts. Because this reverses the scouring action of the current close to underwater objects, it encourages a bank of sand to form over and around the pipeline. The system can also be used to protect the legs of drilling rigs. ICI Fibres reckon the cost to be about £30,000 per mile of pipeline protected.

ICI Trading Results 1969 the first six months

Increases in sales, profits and exports over the figures for the corresponding period last year were all reported in the announcement of the Group results for the first six months of 1969. It is expected that sales will continue to increase during the second half – but factors at home and abroad are reducing profit margins. Sales in the first half rose to £668m, an increase of £65m over last year's figure. Group profits before tax and investment grants went up by £15m to £91m. Overseas subsidiaries greatly helped this improvement.

Group Sales to external customers



First 6 months of 1968 £603m



First 6 months of 1969 £668m

Group Profit before Taxation and Investment Grants



First 6 months of 1968 £76m



First 6 months of 1969 £91m

PPL's new science group

The formation by Plant Protection Ltd of a new Environmental Sciences Group at the ICI Agricultural Research Station, Jealott's Hill, Berkshire, indicates the emphasis placed by the Company on safety in the design and development of new pest control chemicals.

The new group will be concerned with all aspects of the behaviour of these physiologically active compounds in plants and in the soil, and with any long-term effects they may have on the environment. It will be managed by Dr A. Calderbank, who has been Chemical Group manager at Jealott's Hill, and will draw together four existing sections whose work has expanded rapidly in recent years: the biochemistry, soil science, ecology and registration and technical literature sections. The group will also include information and library services.

The group will make detailed investigations of residues in food crops; uptake, distribution and metabolism in plants; and studies in microbial decomposition of the chemicals on natural biological processes in soil, on soil fauna and on wild life. Other studies, of the fundamental mode-of-action of pest control chemicals and plant physiology, may lead to a better understanding of the biochemical systems of the plant or insect under attack, so leading to the synthesis of more specific, less toxic products.

The ICI Industrial Hygiene Laboratory at Alderley Park, Cheshire, will continue to carry out various studies with animals. The results of this animal work, together with the plant, soil and ecology studies, will then be passed to the registration and technical literature section. This is responsible for writing recommendations for the safe use of new products and obtaining approval for their use from Government health authorities. Its members are familiar with the regulations and special requirements in most major countries.

October in your garden

Percy Thrower

Looking back over the summer we could most certainly class this as the 'Rose Year'. It is a very long time since we have seen them better. At the Gardening Centre, Syon Park, they provided a mass of colour from June onwards. There is no reason to believe they are finished yet: given reasonable weather, they should continue for several weeks. Last year we cut the odd few rose buds as late as December. This proves what I so often claim, that the rose is the cheapest form of luxury today – and being always in the garden, it keeps the recurring work down to a minimum.

Preparations are going ahead at the moment at the Gardening Centre to plant new varieties for next year. Some varieties of roses, Queen Elizabeth in particular, grow very tall, five or more feet high. The winds during the autumn and winter blow the bushes backwards and forwards, loosening them with possible damage to the roots. Taller branches which have now finished flowering can be cut back to half their length. This I would call half-pruning, with final pruning to be done next March.

Autumn tints should this month be at their best and nowhere are there better autumn colours than at the Gardening Centre. The swamp cypresses by the lakeside turn rich bronze and the weeping willows turn a golden-yellow. The large specimen liquid ambers, such as can be seen nowhere else in the country, take on a lovely scarlet and gold. Many other fine specimen trees and shrubs have their own particular autumn colours.

It is not a nice thought to think of cold nights to come, with sharp frosts which will blacken the dahlias and put an end to so many of the bright colours in the garden. Dahlias are among the first to suffer frost damage. As soon as this happens, the tuberous roots must be lifted and stored away for the winter. Lift the roots with as little damage to the tubers as possible. Tie a label to the base of each stem after writing on it the colour, the variety and the height to which the plant grows.

Tops should be cut off nine inches above ground level. Then clean most of the soil off the roots and place the plants stem downwards so that any surplus water which may have collected in the hollow stems can drain away. After three or four weeks, stems and roots should be reasonably dry. They can then be dusted with yellow flowers of sulphur, wrapped in newspaper and stored away in a cool, frost-proof place for the winter.

In the vegetable garden, lift and store some of the crops, including carrots and beetroot. While the tops can be cut from the carrots, those of the beetroot should be twisted off. The roots are best stored in dry sand. They can be put into reasonably deep boxes, a layer of sand, a layer of roots, a layer of sand and so on until the box is filled. The boxes can then be kept in the garden shed or in the garage.

Onions, even those lifted last month, should now be completely dry and the bulbs thoroughly ripe. These can be laid in trays in single layers or tied into ropes and hung in a cool, airy place in the garden shed or the garage. Those crops remaining in the garden show good promise for the winter. These include the brussels sprouts, cabbage savoy, cabbage January King, celery, leeks and parsnips. If we have planned and planted our vegetable garden as we should have done, there should be no shortage of fresh vegetables during the late autumn, winter and early spring.

During the early part of the month the latest of the indoor flowering chrysanthemums must be brought into the greenhouse; before bringing them in they should be sprayed with Sybol, mixed with water, to which has been added ICI's General Garden Fungicide. This ensures that we are not taking into the greenhouse pests and diseases that will increase very rapidly inside its congenial atmosphere.

We must turn the heat on to ensure a good circulation of air in the greenhouse, and if the heating is thermostatically controlled the thermostat need not be set higher than 45°F. We must be much more careful with the watering now that the days are shortening. Finally, we must not forget to buy those pre-cooled daffodils, prepared hyacinths, early single and early double tulips to plant in moistened bulb fibre in the pots and bowls. After planting, keep them in a cool, dark place for six to eight weeks. These will provide us with flowers from December over the Christmas period, and well into the New Year.

Even during the dark days of late autumn and winter our garden and greenhouse can provide us with a lot of joy.

'Biddenham Fire', a new virus-free variety of dahlia from Ayletts' nurseries



IVORIES ON 'PERSPEX'



Carson Ritchie

Ever since I worked in the offices of the Castner Kellner Plant at Weston as a vacation student worker in 1958, I have been fascinated by the glowing colours of 'Perspex' acrylic sheeting. I wondered at the time how I could adapt it to the ivory sculptures which I was planning. Much later I was able to visit Dieppe, where I got a clearer idea of how it could be put to use in partnership with ivory. The Dieppe carvers, prolific artists whose work in ivory ranges from the sixteenth century to the present day, are well represented in the museum of the beautiful Chateau of the port. Although their artistic output ranges from crucifixes to toys and chessmen, one of its major forms is the ivory picture. These are quite small, and were intended to be mounted in the lids of snuff-boxes, or in brooches rather than be hung on the wall.

To offset the creamy richness of the African ivory imported to France through the port of Dieppe, the local carvers chose a dark blue glass mount, against which their silhouetted figures appeared in admirable relief. I had already been carving cut-outs from ivory for some time, but had been puzzled by the problem of a background for their display. I had toyed with the idea of a fabric backing to the sculptures – an idea which had a considerable vogue in Victorian times. However after seeing the Dieppe ivories (some of which, for those who cannot get to France, are displayed in the Maritime Museum at Greenwich, I decided to try blue glass. I soon found that although this might have been the ideal medium for sculptors of the seventeenth and eighteenth centuries, it fell far short of the ideal today. In the first place, to be a really dark blue, the glass has to be pot glass – the kind used for making stained glass windows. This means it is expensive, and very hard to get even in the limited number of shades available. Most stockists do not keep pot glass, and are not pleased to have an order placed with them for it. Furthermore, to ensure correct frame fitting the glass has to be cut by a professional glass-cutter. Once the glass is in the frame, fastening it in is a tricky business, and even when this is done, the whole picture is still so fragile that even a slight jar can shatter the whole of it and disperse the small pieces of ivory which make up the composition.

Not merely are there practical considerations against using glass, there are artistic ones as well. It is a lifeless surface, through which light penetrates and does not rebound. Perhaps the Dieppe carvers were able to overcome these difficulties by using

Examples of Carson Ritchie's work – 'Back from the Hunt' (above), from the collection of Mrs Rosalie Silverstone, and 'Pleasures of the Seashore' (below). He finds 'Perspex' the ideal material for mounting his sculptures in ivory



IVORIES ON 'PERSPEX'

a special kind of glass not obtainable today. I was not, and I should have gone no further in the way of finding a background for my cut-outs if I had not luckily thought of the 'Perspex' sheets I had seen.

Here, at last, was the ideal material; it could readily be sawn into the right sizes for frames, it required no polishing, took adhesives readily, and retained them, and came in a much wider and more attractive range of colours than glass. If it was necessary to move one of the cut-outs to another part of the frame, the ivory could be unfixed by sliding a razor blade underneath it and moving it to another position. The old adhesive could be pared off and the 'Perspex' repolished with 'Perspex' polish.

Best of all from the artist's point of view, the material had the right degree of opaqueness. It let in some light, but not too much, forming a living background for the ivories and reflecting plenty of light from the background on to the sides of the ivory silhouettes. The colours were attractive and modern, always a consideration with a sculptor who has to please patrons as well as gallery committees.

I had no difficulty in adapting my cut-outs to 'Perspex', and I now use no other material except for panels of glass *smalti* – a sheet of glass fused with gold or silver leaf. Although smalti gives an undeniable richness to a background (why is there no gold and silver 'Perspex'?) I do have adhesive troubles with it and again and again my sculptures have come off the background. On the other hand I have never had any trouble with 'Perspex'.

In November 1968 I was able to try this completely new combination of ivory and 'Perspex' on the public taste. I had two sculptures hung in the Royal Society of Miniature Painters, Sculptors and Gravers. So far as I know they were the first miniatures employing 'Perspex' ever to be exhibited. This year some more of my exhibits were hung there. Although, like other artists, I tend not to have any special favourites among my own works, I noticed that when I showed my friends round the gallery they tended to admire one of them in preference to the others – the one mounted on 'Perspex'. This, as it turned out, was the one that sold first.



Above: animals and birds, real and imaginary, make up 'The Wonders of Arabia', in which the ivory figures are set against a background of deep red 'Perspex'. Above right: it was the sight of some Chinese ivories when only a small boy which led to Carson Ritchie's interest in carving ivories – and there is a strong feeling of the East in 'The Harbour', in which sculptures of ancient boats and a lighthouse are set against a background of purple 'Perspex'. Right: this feeling for the East and for creatures from the mythology of the oceans is shown just as strongly in this sculpture, called, simply, 'At Sea'. Far right: this section from 'The Delta', mounted on green 'Perspex', shows the detail work in many of the sculptures

